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PATENT APPLICATION AF

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IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Baggs

Confirmation No.: 4007

Application No.: 09/846,408

Examiner: Couso, Yon Jung

Filing Date: 5/01/01

Group Art Unit: 2625

Title: System and Method for Improving Image Quality in Processed Images

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on ***4/18/05***.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

( ) (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

( )	one month	$120.00
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( ) The extension fee has already been filled in this application.

(*X*) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

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Respectfully submitted,

Baggs

By _____

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Confirmation No.: 4007
Scott Baggs	Group Art Unit: 2625
Serial No.: 09/846,408	Examiner: Couso, Yon Jung.
Filed: May 1, 2001	Docket No. 10004917-1

For: System and Method for Improving Image Quality in Processed Images

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APPEAL BRIEF UNDER 37 C.F.R. §1.192

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Sir:

This is an appeal from the decision of Examiner Couso, Yon Jung, Group Art Unit 2625, mailed January 19, 2005, rejecting claims 14-19, 27, 28, and 30-32 in the present application and making the rejection FINAL.

I. REAL PARTY IN INTEREST

The real party in interest of the instant application is Hewlett-Packard Development Company, a Texas Limited Liability Partnership having its principal place of business in Houston, Texas.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF THE CLAIMS

Claim 1-28 and 30-35 are pending in this application (claim 29 was canceled during the prosecution). The Office Action has allowed claims 1 – 13, 20 – 26, and 33-35. Therefore, only the rejections of claims 14-19, 27-28, and 30-32 are the subject of this appeal. The Office Action rejected claims 27 and 28 under 35 U.S.C. § 112, first paragraph, as allegedly not described in the specification in a way to convey to one skilled in the art that the Applicant had "possession of the invention." The Office Action rejected claims 14-19 and 30-32 under 35 U.S.C. §102(e) as allegedly anticipated by *Mancuso et al.* (U.S. Patent No. 6,285,801), hereafter "*Mancuso*." The Office Action further rejected claim 27 under 35 U.S.C. §102(b) as allegedly anticipated by *Lakshminarayanan et al.* (U.S. Patent No. 5,933,540), hereafter "*Lakshminarayanan*." Independent claims 27 and 30 (and respective dependent claims 28 and 31-32) were amended during the prosecution of this application. The remaining claims under appeal are in their original form.

IV. STATUS OF AMENDMENTS

Applicant attempted to amend claim 28 after the FINAL Office Action to delete the phrase "step of." However, the Advisory Action subsequently received indicated that that amendment would not be entered. No other amendments have been made or requested since the mailing of the FINAL Office Action and all amendments submitted prior to the FINAL action have been entered. A copy of the current claims is attached hereto as Exhibit A.

V. SUMMARY OF CLAIMED SUBJECT MATTER

As reflected in independent claim 14 (see FIGs. 2-5), embodiments of the invention are directed to an image processing system 100 suited for post-processing compressed and decompressed images. The embodiment comprises means 400 for analyzing data associated with a plurality of picture elements (*see e.g.,* 322 of FIGs. 3A and 3B) comprising at least one image frame to identify portions (*see e.g.*, reference number 330, FIG. 3B) of the at least one image frame that contain image artifacts, means (*see e.g.*, reference numeral 500 of FIGs. 2 and 5) for smoothing at least one data value associated with the plurality of picture elements in the identified sub-portion (*see e.g.*, reference numeral 330, FIG. 3B) of the at least one image frame (*see e.g.*, p. 14, lines 22-25), and means (*see e.g.*, reference numeral 150, FIG. 2, and p. 17, lines 8-10) for assembling an image artifact reduced image comprising smoothed picture elements.

As reflected in independent claim 27 (see FIGs. 6-8B), embodiments of the invention are directed to a method for identifying image artifacts introduced in a compressed and decompressed sub-region of an image (*see e.g.*, FIG. 7 and pp. 19-20). The embodiment comprises performing at least one statistical test (*see e.g.*, p. 19, lines 10-15) over a plurality of picture element data values comprising the sub-region to generate a test result, determining

a maximum picture element data value for the sub-region, and determining when the absolute value of the difference between the maximum picture element data value and the test result exceeds a predetermined threshold (*see e.g.*, p. 19, lines 24-30).

As reflected in independent claim 30, embodiments of the invention are directed to a system, similar to that defined in claim 14 (summarized above). In addition, embodiments of claim 30 further comprise a region sensitivity value (see e.g., FIG. 5 and p. 16, lines 5-10) as a part of the means 400 for analyzing data.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Independent claim 14 stands rejected under 35 U.S.C. §102(e) as allegedly anticipated by *Mancuso*.

Independent claim 27 stands rejected under 35 U.S.C. § 112, first paragraph, as allegedly not described in the specification in a way to convey to one skilled in the art that the Applicant had "possession of the invention."

Claim 27 also stands rejected under 35 U.S.C. §102(b) as allegedly anticipated by *Lakshminarayanan*.

Independent claim 30 stands rejected under 35 U.S.C. §102(e) as allegedly anticipated by *Mancuso*.

VII. ARGUMENT

Discussion of Rejection of Claims 27-28 Under 35 U.S.C. § 112, First Paragraph

The Office Action rejected claims 27 and 28 under 35 U.S.C. § 112, first paragraph, as allegedly not described in the specification in a way to convey to one skilled in the art that the Applicant had "possession of the invention." In this regard, the Office

Action objected to the added limitation of "the absolute value of the difference between the maximum picture element data value and the test result exceeds a predetermined threshold." Applicant respectfully disagrees with this rejection. Claim 27 actually recites:

> 27. A method for identifying image artifacts introduced in a compressed and decompressed sub-region of an image, comprising:
> performing at least one statistical test over a plurality of picture element data values comprising the sub-region to generate a test result;
> determining a maximum picture element data value for the sub-region; and
> ***determining when the absolute value of the difference between the maximum picture element data value and the test result exceeds a predetermined threshold.***

(*Emphasis added* to element in issue). In support of this language, the specification states (see p. 15, lines 17-22): "The region discontinuity identifier 440 may be configured to generate the absolute value of the difference between both the min. and max. picture element data values within the region with the mean picture element data value for the region. In addition, the region discontinuity identifier 440 may be configured to compare the differences with the image artifact detection threshold supplied by the controller 110 (FIG. 2)." (Underlining added to illustrate support for the claim language.) The "mean picture element data value," as described in the specification, clearly should be understood (in this context) to be the claimed "test result." In this respect, other portions of the specification state that a "statistical test" (other than a mean value) could be performed. Therefore, the claimed "test result" broadly encompasses a "mean" or other "statistical" test. The second sentence of the specification quoted above was not mentioned by the Office Action, but clearly supports the comparison of the difference between the max picture element data value and test result with a predetermined threshold (e.g., the "image artifact detection threshold"). Accordingly, at least these two sentences of the specification

clearly support the claim element as previously amended. For at least this reason, the rejection under 35 U.S.C. § 112, first paragraph, should be overturned.

Discussion of Rejection of Claims 14-19 and 30-32

The Office Action has rejected claims 14-19 and 30-32 under 35 U.S.C. §102(e) as allegedly anticipated by *Mancuso*. For at least the reasons set forth below, Applicant respectfully disagrees and requests that these rejections be overturned.

Independent claim 14 recites:

> 14. An image processing system suited for post-processing compressed and decompressed images, the system comprising:
> ***means for analyzing data associated with a plurality of picture elements comprising at least one image frame to identify portions of the at least one image frame that contain image artifacts***;
> means for smoothing at least one data value associated with the plurality of picture elements in the identified sub-portion of the at least one image frame; and
> ***means for assembling an image artifact reduced image comprising smoothed picture elements.***

(*Emphasis added.*)

In this regard, Applicant notes that the emphasized elements of claim 14 (like the other elements) are set forth in means-plus-function format. Pursuant to 35 U.S.C. § 112(6), a claim element recited in means-plus-function format "shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." 35 U.S.C. § 112, ¶ 6. The Federal Circuit has clearly endorsed this statutory mandate by holding that claims interpreted under 35 U.S.C. § 112, paragraph 6, are limited to the corresponding structure disclosed in the specification and it equivalents. Kahn v. General Motors Corp. 135 F.3d 1472, 45 U.S.P.Q.2d 1608 (Fed. Cir. 1998).

There should be no question but that the elements recited in claim 14 are to be construed pursuant to 35 U.S.C. § 112, paragraph 6. In *Greenberg v. Ethicon Endo-Surgical Inc.*, 91 F.3d 1580, 39 U.S.P.Q. 2d 1783 (Fed. Cir. 1996), the Federal Circuit stated that the use of "means for" language generally invokes 112(6). Indeed, only if means-plus-function claim elements recite sufficient structure to carry out the function are they taken out of the gambit of 35 U.S.C. § 112, paragraph 6. *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 41 U.S.P.Q.2d 1001 (Fed. Cir. 1996).

Indeed, the Federal Circuit reiterated in *Sage Products, Inc. v. Devon Industries, Inc.*, 126 F.3d 1420, 44 U.S.P.Q.2d 1103 (Fed. Cir. 1998) that "the use of the word 'means,' which is part of the classic template for functional claim elements, gives rise to 'a presumption that the inventor used the term advisedly to invoke the statutory mandates for means-plus-function clauses." Ultimately, the Court in *Sage* construed the relevant claim elements under 35 U.S.C. § 112(6), because 'means' were recited, and the claim elements did not "explicitly recite[s] the structure, material, or acts needed to perform the [recited] functions. *Sage* at p. 1428. The Federal Circuit further acknowledged this presumption in *Al-Site Corp. v. VSI International, Inc.*, 174 F.3d 1308, 50 U.S.P.Q.2d 1161 (Fed. Cir. 1999).

Thus, claim elements expressed in means-plus-function format are construed in accordance with 35 U.S.C. § 112, paragraph 6, as set forth above, and as further described in *In re Donaldson* 16 F.3d 1189, 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994)(*en banc*). Therefore, the various " means" elements must be construed in accordance with the structure set forth in the present specification. In this regard, Applicant notes that, in *In re Donaldson,* the Board of Patent Appeals and Interferences advanced the legal proposition that " limitations appearing in the specification are *not* to be read into the claims of an application." *In re*

Donaldson at 1848. This argument, however, was rejected by the Federal Circuit, which held, as a matter of law, that " one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure ... described therein, and equivalents thereof. *In re Donaldson* at 1848. Furthermore, the holding in *In re Donaldson* does not conflict with the principle that claims are to be given their broadest reasonable interpretation during prosecution. *In re Donaldson* at 1850.

The means-plus-function elements of claim 14 must be construed in accordance with Applicant' s specification. Presently, however, the Office Actions to date have offered no such construction to this claim. Instead, the Office Actions have focused exclusively on the functional language of this claim, and have offered no construction in accordance with the present specification. For at least this reason, Applicant submits that the rejection of claim 14 should be overturned, as being incomplete and legally deficient.

Notwithstanding, and in an effort to assist the Board and advance the prosecution of this application, Applicant provides the following, further discussion and distinction with respect to this claim. With regard to the " means for analyzing..." element emphasized above, the Office Action cited col. 2, lines 45-46 and col. 4, lines 4-12 of *Mancuso* as allegedly anticipating this element. Applicant respectfully disagrees. In this regard, the cited portions of *Mancuso* actually state:

> A filter, and in particular, a non-linear adaptive filter to reduce blocking artifacts is described herein....
>
> ...
>
> FIG. 3 illustrates one image block 202 partitioned into several pixels, wherein a pixel is designated by 302. A target pixel 302i, i.e., the pixel to be processed using the filter 100, and neighboring pixels are defined by a sub-block of the image 100, called a processing window 304. The center of the processing window is moved from pixel to pixel starting, for example, at the top left corner, and an operator is applied to the pixels to determine the pixels' metrics. For example, FIG. 3 illustrates a 4*8 processing window 304 with 32 pixels.

As can be readily verified from even a cursory review of the above-quoted (cited) portions, *Mancuso* fails to teach the claimed "means for analyzing data associated with a plurality of picture elements comprising at least one image frame to identify portions of the at least one image frame that contain image artifacts." In this regard, this "means for analyzing..." element should be properly associated with the "artifact detector" (reference numeral 400), as described in the specification. In this regard, the specification describes that the artifact detector identifies picture element data discontinuity (see e.g., paragraph spanning pages 10 and 11). No such corresponding teaching is disclosed or suggested in the above-cited portions of *Mancuso*, and these relevant teachings of the Applicant's specification cannot be ignored when properly construing the means-plus-function elements of claim 14. For at least this reason, the rejection of claim 14 is misplaced and should be overturned.

As a separate and independent basis for the patentability of claim 14, claim 14 also defines "means for assembling..." which is neither taught nor disclosed in *Mancuso*. The Office Action merely cites the "output" shown in figure 1 of *Mancuso* as allegedly teaching this claimed feature. Applicant disagrees. The output of figure 1 is merely illustrated as a signal line out of a block labeled "De-Blocking System." This teaching, however, falls far short of disclosing the "***means for assembling an image artifact reduced image comprising smoothed picture elements,***" particularly when this element is properly construed in accordance with the teachings of the specification.

For at least the foregoing reasons, the rejection of claim 14 is misplaced and should be overturned. Claims 15-19 depend from claim 14 and, as they incorporate all of the features of claim 14, should be allowed for at least the same reasons.

Discussion Rejection of Claims 27 and 28 Under 35 U.S.C. § 102(b)

The Office Action further rejected claim 27 under 35 U.S.C. §102(b) as allegedly anticipated by *Lakshminarayanan*.

In setting forth this rejection, the Office Action affirmatively stated that it did not consider the language of the claim (as previously amended). Applicant has shown above where the amended claim language is supported by the specification. Therefore, Applicant submits that claim 27 defines over the cited art for reasons set forth in the prosecution of this application. In this regard, the cited reference fails to disclose, teach, or suggest Applicant's method for identifying image artifacts introduced in a compressed and decompressed sub-region of an image for at least the reason that the cited reference is silent regarding "***determining when the absolute value of the difference between the maximum picture element data value and the test result exceeds a predetermined threshold.***" The statistical noise determination mechanism apparently disclosed from column 8, line 55 to column 10, line 7 of *Lakshminarayanan* fails to describe a function that includes the absolute value of the difference between a maximum picture element data value and a statistical test result. Consequently, *Lakshminarayanan* cannot anticipate Applicant's independent claim 27.

Accordingly, for at least the foregoing reason, Applicant respectfully requests that the rejection of claim 27 be overturned. Claim 28 depends from claim 27 and, as it incorporates all of the features of claim 27, should be allowed for at least the same reason.

Discussion Rejection of Claims 30-32 Under 35 U.S.C. § 102(e)

The Office Action also rejected claims 30-32 under 35 U.S.C. §102(e) as allegedly anticipated by *Mancuso*. For at least the reasons set for below, Applicant respectfully disagrees and requests that these rejections be overturned.

Independent claim 30 recites:

> 30. An image processing system suited for post-processing compressed and decompressed images, the system comprising:
> ***means for analyzing data associated with a plurality of picture elements comprising at least one image frame to identify portions of the at least one image frame that contain image artifacts, the means for analyzing data comprising a region sensitivity value;***
> means for smoothing at least one data value associated with the plurality of picture elements in the identified sub-portion of the at least one image frame; and
> ***means for assembling an image artifact reduced image comprising smoothed picture elements.***

(*Emphasis added.*)

The Office Action failed to set out or explain a separate rejection of this claim. In this regard, this claim has been rejected for exactly the same reasons as claim 14 (even though there are differences in the claim language). Applicant acknowledges that the elements of this claim loosely correspond to the elements of claim 14 (with the exception that claim 30 further defines the "means for analyzing data comprising a region sensitivity value." The FINAL Office Action, however, did not even address this claimed feature. Thus, the rejection of claim 30 should be overturned for at least the same reason as claim 14. Additionally, the rejection of claim 30 should be overturned for the failure of the cited reference to disclose the claimed "region sensitivity value" as a part of the "means for analyzing" (in addition to the Office Action's failure to even allege, with specificity, the disclosure of this claimed feature). Stated another way, the Office Actions (to date) have failed to carry the Examiner's burden of establishing a *prima facie* rejection of the claim,

as the Examiner has wholly ignored a feature of the claimed invention. Accordingly, and for at least these reasons, the Board should overturn the rejection of claim 30.

In addition to the foregoing, Applicant submits that the failure (to date) of any Office Action to properly construe the "means-plus-function" claim elements in accordance with the corresponding structure, material, and acts described in the specification mandates an overturning of the Examiner's rejections (as claim construction, in the first instance, is the responsibility of the Examiner) and requires a proper construction by the Patent Office. To date, no such legally-proper construction has been rendered, and thereby warrants the overturning of the rejections by the Examiner.

Claims 31 and 32 depend from claim 30 and, as they incorporate all of the features of claim 30, should be allowed for at least the same reasons.

CONCLUSION

Based upon the foregoing discussion, Applicants respectfully requests that the Examiner's final rejection of claims 14-19, 27-28, and 30-32 be overturned by the Board, and that the application be allowed to issue as a patent with all pending claims 1-28 and 30-35.

Please charge Hewlett-Packard Company's deposit account 08-2025 in the amount of $500 for the filing of this Appeal Brief. No additional fees are believed to be due in connection with this Appeal Brief. If, however, any additional fees are deemed to be payable, you are hereby authorized to charge any such fees to deposit account No. 08-2025.

Respectfully submitted,

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VIII. CLAIMS - APPENDIX

1. An image processing system suited for post-processing compressed and decompressed images, the system comprising:

a region segmenter configured to sub-divide data representing at least one image frame to generate a plurality of image regions;

an artifact detector configured to analyze each of the plurality of image regions for the existence of an image artifact, the artifact detector further configured to identify regions containing an image artifact;

a filter configured to receive an indication of image regions containing an image artifact from the artifact detector, wherein the filter smoothes at least one picture element data value in accordance with at least one viewer selected parameter to generate modified picture element data; and

an output memory communicatively coupled with the input memory and with the filter wherein the output memory assembles an image artifact reduced image frame comprising unmodified picture element data from the at least one image frame and smoothed picture element data to generate an artifact reduced representation of the at least one image frame.

2. The system of claim 1, wherein the region segmenter sub-divides the at least one image frame in response to a viewer selected region sensitivity value.

3. The system of claim 1, wherein the artifact detector applies at least one statistical test to the picture element data values comprising the region to identify when the region contains an image artifact.

4. The system of claim 1, wherein the filter selectively smoothes picture element data values comprising the region in response to a block sensitivity parameter and a picture element data value comparison threshold.

5. The system of claim 1, wherein the filter comprises an edge-preserving low-pass filter.

6. The system of claim 1, further comprising:

a communications port configured to receive the at least one viewer selected imaging parameter; and

a controller communicatively coupled with the communications port wherein the controller is configured to control the flow of picture elements in response to the at least one viewer selected imaging parameter.

7. The system of claim 1, further comprising:

a delay module configured to receive a decompressed audio signal, wherein the delay module synchronizes the image artifact reduced image frame with the decompressed audio signal.

8. The system of claim 2, wherein the viewer selected region sensitivity value defines a plurality of picture elements equivalent to the square of the region sensitivity value.

9. The system of claim 3, wherein the at least one statistical test comprises a mean picture element data value.

10. The system of claim 4, wherein the filter smoothes picture element data values when both the absolute value of the difference between picture element data values for adjacent picture elements exceeds the picture element data value comparison threshold and wherein the compared picture elements form a block boundary as defined by the square of a block sensitivity value.

11. The system of claim 4, wherein the block sensitivity parameter and the picture element data value comparison threshold are viewer selected.

12. The system of claim 9, wherein an absolute value of the difference between the mean picture element data value and a maximum picture element data value for the region provides a first interim result, and wherein an absolute value of the first interim result is compared with an image artifact detection threshold.

13. The system of claim 9, wherein an absolute value of the difference between the mean picture element data value and a minimum picture element data value for the region provides a second interim result, and wherein an absolute value of the second interim result is compared with an image artifact detection threshold.

14. An image processing system suited for post-processing compressed and decompressed images, the system comprising:

means for analyzing data associated with a plurality of picture elements comprising at least one image frame to identify portions of the at least one image frame that contain image artifacts;

means for smoothing at least one data value associated with the plurality of picture elements in the identified sub-portion of the at least one image frame; and

means for assembling an image artifact reduced image comprising smoothed picture elements.

15. The system of claim 14, wherein the means for analyzing comprises performing at least one statistical test on the picture element data values on a sub-portion of the at least one image frame.

16. The system of claim 14, wherein the means for smoothing comprises a mathematical combination of a picture element of interest with an adjacent picture element in a first direction to form a first smoothing result, followed by a mathematical combination of the picture element of interest with an adjacent picture element in a second direction using the first smoothing result for the picture element of interest data value for those cases where the picture element of interest is adjacent to a block as defined by a block sensitivity value.

17. The system of claim 14, wherein the means for assembling comprises a frame memory device configured to store both unmodified picture element data and modified picture element data, wherein modified picture element data supersedes unmodified picture element data.

18. The system of claim 15, wherein the at least one statistical test comprises determining the mean picture element data value on a sub-portion of the at least one image frame.

19. The system of claim 16, wherein the mathematical combination of a picture element of interest with an adjacent picture element comprises determining the average data value of the picture element of interest and the adjacent picture element and updating the data value of the picture element of interest with the determined average.

20. A method for reducing image artifacts in a compressed and decompressed image, comprising:

receiving picture element data associated with at least one image frame;

segmenting the at least one image frame into a plurality of regions in accordance with a first viewer selected imaging parameter;

analyzing the plurality of segmented regions to identify regions that contain an image artifact in response to a second viewer selected imaging parameter;

processing the identified regions with an adaptive filter such that at least one picture element data parameter is adjusted in response to both a third and a fourth viewer selected imaging parameters; and

inserting adjusted picture element data values into the at least one image frame.

21. The method of claim 20, wherein the first viewer selected imaging parameter applied in the segmenting step comprises a region sensitivity value.

22. The method of claim 20, wherein the second viewer selected imaging parameter applied in the analyzing step comprises an image artifact detection threshold.

23. The method of claim 20, wherein the third and the fourth viewer selected imaging parameters applied in the processing step comprise a block sensitivity value, and a picture element comparison threshold, respectively.

24. A method for smoothing at least one data value associated with a plurality of picture elements containing image artifacts introduced in a compressed and decompressed image, comprising:

setting a plurality of counters and a plurality of thresholds in response to a plurality of viewer selected imaging parameters;

systematically comparing each of a plurality of picture element data values with a data value associated with an adjacent picture element in a first direction to generate a first interim result, further comparing the first interim result with a first viewer selected imaging parameter, selectively modifying the data value for a picture element of interest to generate a temporary picture element data value when the compared picture elements traverse a block boundary as defined by a second viewer selected imaging parameter;

inserting temporary picture element data values; and

systematically comparing each of the plurality of picture element data values, including the inserted temporary picture element data values with an adjacent picture element in a second direction to generate a second interim result, further comparing the second interim result with a first viewer selected imaging parameter, selectively modifying the data value for a picture element of interest to generate a final picture element data value when the compared picture elements traverse a block boundary as defined by a second viewer selected imaging parameter.

25. The method of claim 24, wherein the steps of comparing are responsive to a first viewer selected imaging parameter comprising a smoothing threshold.

26. The method of claim 24, wherein the steps of comparing are responsive to a second viewer selected imaging parameter comprising a block sensitivity value.

27. A method for identifying image artifacts introduced in a compressed and decompressed sub-region of an image, comprising:

performing at least one statistical test over a plurality of picture element data values comprising the sub-region to generate a test result;

determining a maximum picture element data value for the sub-region; and

determining when the absolute value of the difference between the maximum picture element data value and the test result exceeds a predetermined threshold.

28. The method of claim 27, wherein the step of determining a maximum picture element is replaced with determining a minimum picture element data value for the sub-region and the step of determining when the absolute value of the difference between the maximum picture element data value and the test result is replaced by determining when the absolute value of the difference between the minimum picture element data value and the test result exceeds a predetermined threshold.

29. (Canceled)

30. An image processing system suited for post-processing compressed and decompressed images, the system comprising:

means for analyzing data associated with a plurality of picture elements comprising at least one image frame to identify portions of the at least one image frame that contain image artifacts, the means for analyzing data comprising a region sensitivity value;

means for smoothing at least one data value associated with the plurality of picture elements in the identified sub-portion of the at least one image frame; and

means for assembling an image artifact reduced image comprising smoothed picture elements.

31. The system of claim 30, wherein the means for analyzing comprises performing at least one statistical test on the picture element data values on a sub-portion of the at least one image frame.

32. The system of claim 30, wherein the means for smoothing comprises a mathematical combination of a picture element of interest with an adjacent picture element in a first direction to form a first smoothing result, followed by a mathematical combination of the picture element of interest with an adjacent picture element in a second direction using the first smoothing result for the picture element of interest data value for those cases

where the picture element of interest is adjacent to a block as defined by a block sensitivity value.

33. A method for reducing image artifacts in a compressed and decompressed image, comprising:

receiving picture element data associated with at least one image frame;

segmenting the at least one image frame into a plurality of regions in accordance with a first viewer selected imaging parameter, the first viewer selected imaging parameter comprising a region sensitivity value;

analyzing the plurality of segmented regions to identify regions that contain an image artifact in response to a second viewer selected imaging parameter;

processing the identified regions with an adaptive filter such that at least one picture element data parameter is adjusted in response to both a third and a fourth viewer selected imaging parameters; and

inserting adjusted picture element data values into the at least one image frame.

34. The method of claim 33, wherein the second viewer selected imaging parameter applied in the analyzing step comprises an image artifact detection threshold.

35. The method of claim 33, wherein the third and the fourth viewer selected imaging parameters applied in the processing step comprise a block sensitivity value, and a picture element comparison threshold, respectively.

IX. EVIDENCE - APPENDIX

None.

IX. RELATED PROCEEDINGS- APPENDIX

None.